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ABSTRACT

This document, which examines the use of educational technologies for distance education for adults in Canada, consists of five narrative sections and a bibliography. The first section introduces the topic and the document's objectives (to describe those technologies used in Canadian adult distance education, paying particular attention to those most widely used; to identify current trends; and to locate centers of excellent practice). The second section describes the use of educational technologies in Canadian higher education, government, private enterprise, and social services. A table lists by province and by type of technology the number of distance learning activities at universities, colleges, school boards, provincial ministries of education, and educational communication authorities. The third section focuses on those technologies most used (for instance, audio conferencing, television, cable systems, satellite, and telephone). Section 4 reports a trend toward cooperation and intergovernmental arrangements for sharing distance education programs and states that Ontario and Quebec use all communication technologies more than do provinces in eastern Canada. Several collaborative distance education projects are discussed, among them the Open Learning Agency, the Canadian Distance Learning Development Center, and the Nova Scotia Educational Communication Agency. Section 5 lists eight agencies and projects "arbitrarily chosen for excellence." The document concludes with a 25-item resource list. (CML)

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ADULT EDUCATION AT A DISTANCE

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FOREWARD

In recent years there has been an impressive growth in the field of distance education. The range and diversity of activities is as broad and varied as Canada itself. There is, however, at least one commonality, the type of student served, namely, the adult part-time lifelong learner.

As providers of adult education opportunities for the New Brunswick population, the Department of Advanced Education and Training needs to have some appreciation of the nature and extent of learning opportunities that have been made available to adults in Canada through the delivery mechanism of distance education.

It was in response to this need that Planning Services commissioned the study reported in this document.

We acknowledge the contribution of the principal investigator, Dr. Alphonse Gaudet, of the Educational Consultants Ltd., who prepared the report.

Janet Higgins
Research and Planning Officer
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INTRODUCTION

Since the turn of the century, the use of technologies in distance education has changed substantially in Canada. The beginnings were very modest compared to present day delivery of distance education for school pupils and for adult learners. Today, the entire field of communication technologies is obviously undergoing rapid change.

Historically speaking, since the 1850's, correspondence education and itinerant teachers were the mainstay of distance education. Some of this methodology is still being effectively used. However, the advent of the telephone, record player, radio, films and especially television, has made it possible to materially alter the delivery of distance education on this country. Furthermore, teleconferencing, computerized interactive hardware and software using a wide variety of mediums such as video tapes, cassettes, cable satellites, audio talkback hook-up, and fax machines have indeed facilitated greatly interactions between uplink site and downlink site locations. The computer, one of the latest technologies, has revolutionized the teaching and learning process, especially in distance education. Technology is moving so fast in this field that one generation of computers quickly becomes obsolete. Faster program execution, improved graphics, increased internal memory, larger data storage capacity all contribute to make expensive computers quickly outdated. Along with the above mentioned, fibre optics has increased transmission speed.

The following pages of this paper aim to first, describe the nature and type of technologies found in distance education in Canada; secondly, focus on the methods most commonly utilized province-wide to dispense continuing education mainly to adult learners; thirdly, identify current trends relating to the use of technologies in education; and finally, to pin-point the existence of centres of excellence in the country.

COMMUNICATION TECHNOLOGIES AND ADULT EDUCATION AT A DISTANCE

The main thrust of this report is to provide an overview of the impact of educational technologies on distance education for adults in Canada. These technologies have been the primary factor behind the expansion of distance education programming for adult learners. Distance education has virtually removed physical barriers for educational opportunities both in training and professional education. Also, it has removed the necessity of full-time attendance in post-secondary education by adults who cannot follow a regular schedule of classes and who cannot afford the expenses incurred in full-time studies. In this report it will be shown how distance education increases accessibility while at the same time providing flexibility in scheduling and satisfying individual needs of adult learners.

Naturally, the type and use of communication technologies employed depends on the nature of the project an the learning needs of adults. In some provinces, distance education correspondence courses make it possible for adults to complete their high school education and for other adult learners who need literacy courses at different levels of instruction. At the community college level of education, distance education is dispensed mainly, it seems, on printed materials and audio-conferencing mediums. Some colleges make use of computer based learning techniques, satellites and video-programming.

Distance education programming has developed in much greater proportions in university milieus. The main reason for this development is that the targeted adult population is often widely dispersed on the territory. Furthermore, community college courses are often technically oriented, aimed at a specific group of learners. Strategically speaking, universities' extension services, in conjunction with regular courses offered on campus, may link down site locations using a wide variety of educational technologies in the process. Two Canadian Universities namely Alberta's Athabasca University and Quebec's Télé-Université concentrate on distance education programming for adult learners using a wide variety of educational technologies.

A wide use of communication technologies is observed in government, private enterprise and social services domains. Users of information technologies in education have expanded to include various Federal Government departments with regards to he use of computer based training. Those with such a commitment include: National Defence, Canada post, Revenue Canada, Taxation, Supply and Services and Transport Canada.

Private industry uses communication technology to serve the training and education needs of their employees enabling its personnel to keep abreast of corporate developments. Large corporations have continent-wide operations with computer technology widely used, and distance education provided through satellite networks.

Hospital associations in some provinces have developed audio-conferencing networks to provide medical in-service training. For example, some post RN programs are offered by teleconference in various parts of the province.

Some large social services companies employ audio and video conferencing technologies for training purposes. Cooperatives and insurance companies, for example, make appropriate use of whatever technology is deemed necessary to train staff and professional personnel. Some telephone companies provide audio and video-teleconferencing services on a commercial basis.

By and large, communication technologies are widely employed in higher education. In 1988, it was reported that 70 universities and colleges were involved in distance learning programs across Canada. It appears that information technologies are in a state of continuous expansion and development in post-secondary education establishments. Table 1, on the following page, includes a listing if distance learning activities at universities, colleges, school boards, provincial ministries of education and educational communication authorities. Also included in the table are activities which support the delivery system as well as those which support the administration of distance education projects and research activities. The type of technology, frequency of use which are employed in distance learning, includes satellites, cable services, television and radio broadcasting and video, audio and computer conferencing. Computer, slow-scan television, electronic blackboards are also listed as other technologies which facilitate the instructional processes.

TABLE 1

TYPE OF TECHNOLOGIES AND FREQUENCY OF USE IN 60 INSTITUTIONS*

	Sattel-ite	Cable	T.V.	Radio	Teleph-one	Audio Conf.	Micro Comp.	Others	
B.C. (6 inst.)	6	6	6		5	4		1	
ALTA. (12 inst.)	3	3	3	2	4	10	6	3	
SASK. (5 inst.)	1		2		2	4	1	1	Fibre optics
MAN. (4 inst.		1	1			3	1		
ONT. (20 inst.)	2	10	11	2	5	14	7	11	Telidon, videodisc slow-scan TV electronic board
QUE. (5 inst.)	4	4	5		4	2	2	4	Telewriters, Telex
N.B. (2 inst.)	2	2	1			2	1	2	Telewriters, electric board
N.S. (5 inst.)	5	4	4		2	3		1	TVRO Network U.S.A.
NFLD. (1 inst.)	1	1	1		1	1	1	1	Anik, Hermes Slow-scan TV, Telewriters
TOTAL (60 inst.)	24	31	33	4	23	43	19		

* Anna Stahmer and Barbara Helm, (1987)
Communication Technology and Distance Learning in Canada:
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UTILIZATION OF TECHNOLOGIES

The foregoing Table I presents data drawn from the previously quoted Stahmer's survey, data that has been collapsed from a chart providing information on sixty universities, colleges and other educational establishments using communication technologies and distance education as partners. For practical reasons, sponsoring agencies within provinces have been grouped together regardless of format of electronic transmission means used; be they satellite, cable systems, off-air broadcasting, microwave links, fibre optics and telephones.

The following Table II indicates the number of sponsoring agencies which utilize available communication technologies. The percentage of use has been computed from the number of establishments using a specific technology in descending order of importance. In the category of "others" found below are listed such technologies as telidon, fibre optics, video disc, electronic mail, slow scan TV, electronic blackboards, telewriters, Anik and Hermes and satellite systems.

TABLE II

Total Number	Type of Technology	Percentage of Use
43/60	Audio conferencing	71%
33/60	Television	55%
31/60	Cable systems	52%
24/60	Satellite	40%
23/60	Telephone	38%
19/60	Microcomputers	32%
4/60	Radio	7%
25/60	"Others"	42%

In Table II, audio conferencing or teleconferencing, as it is very often referred to, is the most frequently used mean for imparting distance education in Canada to pupils and adult learners. This medium allows classroom instructions to be delivered at a distance to one or more remote communities. Audio conferencing is widely used by Universities Extension Departments of New Brunswick in post secondary education courses and in adult education for credit or non credit courses. Audio plus visual forms of conferencing enables students in each location to watch their instructors' presentation and to receive live answers to questions asked.

Television and/or cable systems are used on an almost equal basis, and fall in second and third position in the survey. Television channels are sometimes set aside for non profit educational uses. In order to receive this broadcast television programming, a receiving site must be equipped with a special antenna. Cable transmission systems have the capacity to deliver multiple channels of programming to residential and institutional subscribers over a coaxial cable.

Satellites and telephones fall in fourth and fifth place in communication technologies used for distance education. Although computers are ranked in sixth position this technology appears to be gaining popular support. While radio used to be the medium for delivery systems in distance education at the beginning of this century, high technology has displaced it to seventh position, but still has potential use in some areas where other technologies are not available. The last category, "others", includes trials in telidon, slow-scan TV, electronic mail and electronic blackboard; the expensive nature of some of these high technologies prevents a more elaborate use.

TRENDS

Communication technologies are gaining public attention and interest for the promotion of distance education across Canada. Sponsoring agencies such as networks, universities, colleges and educational agencies have grown rapidly during the past decade. Technological advances, research activities and publication written in this field present a challenge to a person who wants to keep abreast of recent developments.

A definite trend toward cooperation and intergovernmental arrangements for sharing distance education programs has become evident throughout the country. At the 28th annual provincial Premier's conference held in New Brunswick in 1987, it was advanced that improved communication technologies had placed into our hands new means of improving accessibility to education and training. New methods of instruction are arising through the use of computers and telecommunications.

At the 29th annual Premier's conference held in Saskatchewan in 1988, it was again reiterated that these new technologies present tremendous opportunities to meet the growing demand for education and training in appropriate and cost efficient ways. Thus the ministers agreed to support:

- negotiation of interprovincial/territorial agreements for distance education. Such agreements could specify joint projects to be undertaken with possible private sector participation;

- the development of national telecommunications policies which could support educational and training objectives of the provinces and territories;

- the development and sharing of educational software and new strategies for marketing or applying educational technologies.

Two recent Canadian developments occurring in western Canada are highlighted here in details because of the breath and scope of these projects.

Open Learning Agency (OLA) formed in 1988 is the newest member of B.C. Education System. This Agency has been granted a broad and enabling mandate permitting it to provide system-wide leadership in open learning activities. Working in collaboration and cooperation with universities, colleges, institutions, school districts and other agencies concerned with education, the Agency's five major purpose are stated as follows:

- to coordinate the development of open learning education;
- to provide educational programs and services using open learning methods;
- to operate one or more educational broadcasting undertakings;
- to provide an educational credit bank;
- to carry out research related to open learning education.

The OLA, along with Knowledge Network, Open College et Open University will ensure that a comprehensive range of educational and training programs be provided throughout the province.

In 1987, Alberta announced the establishment of the Canadian Distance Learning Development Center (CDCDC), a cooperative venture formed by six partners; Athabasca University, AT & T Canada Ltd, Alberta Government Telephone (AGT), Alberta Educational Communication Corporation (ACCESS), and two provincial government departments, the Department of Advanced Education and the Department of Technology, Research and Telecommunications. The objectives of the CDLDC have been outlined as follows:

- to design and implement distance learning systems that make effective use of technology;
- to employ educational technologies in a cost effective manner;
- to use technologies to develop systems of open learning in which students have better access to post secondary education in spite of barriers of distance and disadvantaged educational backgrounds.

In Atlantic Canada, according to Stahmer's and Helm's survey of communication technologies (referred to earlier) Atlantic Satellite Network (ASN) in Halifax should receive mention as it offers for educational institutions, free-of-charge, twenty hours of access to its distribution system. Some of the institutions in the region interact directly with ASN, whereas others use the DUET facilities at Mount Saint Vincent University to access the satellite (DUET stands for Distance University Education via Television.

Joint collaboration projects in open learning appear to be making headway in Atlantic Canada but at a slower pace than out west. Newfoundland seems to be the leader among provinces at the present time. The Department of Education has a separate quasi-independent section whose main objective is to promote distance education in the province and Labrador. This

department collaborates closely with Memorial University to coordinate distance education.

In Nova Scotia, according to a recent Canadian Education Association newsletter, the province plans to establish an NSECA (Nova Scotia Educational Communication Agency or Network Nova Scotia). The purpose of the agency is to provide media resources to support educational and training programs; to coordinate the educational use of broadcast facilities; to support distance education and promote research on the use of communication technology for education and training.

In New Brunswick both the Universities of New Brunswick and Université de Moncton are engaged in open education activities. Recently, a joint committee has been formed of several agencies who have an interest and responsibility for distance education in anglophone areas of the province namely the Department of Education, the Department of Advanced Education and the University of New Brunswick (New Brunswick Centre for the Promotion of Instructional Technology (CDIT). No communiqués have emerged as to whether or not Université de Moncton wishes to collaborate with similar provincial agencies to promote open-learning in francophone areas of the province and eastern Canada.

In Central Canada, namely Ontario and Quebec, there is an overwhelming use of all communication technologies as compared to eastern canadian provinces. Sponsoring agencies may very well afford to operate on an independent basis, for example, Télé-Université in Quebec is a huge enterprise whose mission is to promote distance education in the province and other francophone countries around the world. Another example, reported in University Affairs, the University of Toronto has recently opened an interactive centre combining latest computer and laser disc technology. Thirty six "high tech" work stations offer courses 12 hours a day, five days a week, courses mostly related to computing and business management personnel.

However, if one may glean from events happening in communication technologies in other parts of the country, western Canada for example, it would definitely seem prudent and wise to enjoin in collaborative projects, in New Brunswick and indeed when possible on a regional basis. Our sparsely populated areas coupled with our limited financial means stymies substantially the use of expensive mediums on the field of communication technologies. As we have previously observed, there is a concerted desire on the part of eastern provincial governments' First Ministers and concerned Departments to establish joint collaborative projects in the delivery of distance education, provincially and ideally, on an interprovincial scale.

CENTRES OF EXCELLENCE

A centre of excellence requires the most qualified teachers who understand the problems and difficulties associated with distance education procedures. Quantitatively speaking, substantial software and hardware should be available to enable a multivariate approach -- interactive mediums such as audio-visual television computer assisted instruction, electronic and tutorial support. In addition printed materials, cassettes and video-disc should be utilized. Another component of a centre of excellence should be the quality of research, both empirically and scientifically undertaken under the auspices of the centre.

Finally, in provinces where financial resources are limited all sponsoring agencies should ideally collaborate in a team system's approach. To summarize any given project development implies, it does seem, the following characteristics:

1) the objectives of the project are clearly defined;
2) the educational technologies utilized are numerous;
3) the project is evaluated for its teaching and learning outcomes.

There appears to be incontrovertible evidence that Centres of Excellence find their location mainly in Universities rather than at Colleges and business establishments. For obvious reasons, qualified personnel for research and program development are more commonly found in university circles. Centres of excellence often operate under the helm of an Agency established by provincial departments of education and universities.

The main aim of the agency is to promote distance education programs through a collaborative approach with universities, colleges, schools and business establishments. Some of Canada's most significant agencies and projects appear to be located as follows (arbitrarily chosen for excellence in the field of distance education):

1) British Colombia's Open Learning Agency (OLA) and the B.C. Access promote or collaborate on significant projects carried out by Knowledge Network, Project North, Simon Fraser University (EXCITE), University of Victoria and North Island College.

2) Alberta's Canadian Distance Learning Development Center (CDLDC) and Alberta Educational Communications

Corporation (ACCESS) assist with significant projects undertaken at Alberta, Athabasca, and Calgary Universities.

3) Saskatchewan's two main bodies involved in distance education are the Saskatchewan's Education Correspondence School and the Saskatchewan's Skills Extension Program (SSEP) with significant projects going on at University of Saskatchewan, and Northlands College.

4) Manitoba's main agency is the Post-Secondary Adult and Continuing Education Division (DFDT) with significant projects carried out at the University of Manitoba and Inter Universities North.

5) Ontario appears to lead in term of number of significant projects underway at numerous universities and colleges viz. Toronto, OISE, Ottawa, Queen's, Guelph (NetNorth), Laurentian, Sheridian College, Ryerson Institute of technology, Confederation of Northern College and Contract North.

6) Quebec; Télé-Université, Universités de Montréal, Laval, Concordia (CANAL), and Direction de la Formation à Distance lead in this province.

7) Newfoundland Division of Post-Secondary Education in cooperation with Memorial University stand out in Atlantic Canada for the quality and their extent of programming for distance education in the province and Labrador.

8) CADE, Canadian Association for Distance Education, has to be mentioned for it's excellent publications and supportive research articles in the field of distance education.

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